REMARKS

Claims 25-37 are pending in the application, and are rejected. Claim 25 is herein amended. Claim 29 is herein canceled.

Objections to the Claims

Claim 29 is objected to as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 29 depends on claim 25. The Examiner notes that the ridged portion in claim 25 is the ridge portion of said cladding layer of first conduction type. The Examiner asserts that because the cladding layer of claim 25 is less than 0.03 μm, the thickness of ridge portion of claim 29 must already be less than 0.03 μm. Therefore, the limitation of claim 29 does not add any new limitation.

Applicants herein cancel claim 29, thus mooting the rejection.

Claim Rejections - 35 U.S.C. §102

Claims 25, 27-30 and 36-37 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,172,382 B1 to Nagahama et al.

Applicants herein amend claim 25 to clarify its limitations. Subsequently, Applicants submit that the cited reference fails to include all the claimed limitations.

The Nagahama reference recites a semiconductor laser device in which a cladding layer has a thickness of less than 0.3 μm, but fails to recite the thickness of a flat portion formed on both sides of a ridge portion. On the other hand, the present invention, as herein amended, includes a flat portion formed on both sides of a ridge portion, the flat portions having recited dimensions. Applicants submit that the rejection should be withdrawn.

Claim Rejections - 35 U.S.C. §103

Claim 26 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,172,382 B1 to Nagahama et al. in view of WO98/39827 to Okumura et al. (6,377,597 to Okumura is used as translation.) The Examiner admits that Nagahama et al. does not necessarily teach the further limitation of the aluminum composition ration as defined by claim 26. However, the Examiner asserts that "Okumura teaches that a lowering of the aluminum composition ratio downward from x = 0.10 (column 6, lines 36-55) has the advantage of decreasing the resistance of the semiconductor laser device (col. 6, l. 45-50)." Regardless of the assertion, Applicants note that Okumura still does not disclose the exact aluminum composition ratio as claimed.

Furthermore, Applicants herein amend claim 25 to clarify its limitations. Subsequently, Applicants submit that the cited reference fails to include all the claimed limitations.

The Nagahama reference recites a semiconductor laser device in which a cladding layer has a thickness of less than 0.3 μm, but fails to recite the thickness of a flat portion formed on both sides of a ridge portion. On the other hand, the present invention, as herein amended, includes a flat portion formed on both sides of a ridge portion, the flat portions having recited dimensions. Applicants submit that the rejection should be withdrawn.

The Examiner notes that Applicant does not disclose why the difference between an aluminum composition ratio of not more than 0.05 as claimed and of about or substantially less than 0.1 as taught by Nagahama et al. and Okumura, respectively, is critical to the invention.

Applicants disagree with the assertion that Applicant does not disclose why the difference between an aluminum composition ratio of not more than 0.05 as claimed, and about or less than

0.1 as taught by Nagahama et al. and Okumura, is critical to the invention. The paragraph beginning on page 23, line 24 indicates that, "the Al composition ratio of the cladding layer is set to not more than 0.05, thereby making it possible to reduce a strain induced in the nitride based semiconductor layer at the time of growing the nitride based semiconductor layer and to prevent the nitride based semiconductor layer from being cracked. Consequently, it is possible to reduce the operating voltage in the nitride based semiconductor light emitting device without reducing the yield of the device."

The Okumura reference is cited for the aluminum composition of a cladding layer, and fails to recite a semiconductor laser device in which a cladding layer has a thickness of less than 0.3 μm. Applicants note that the Okumura reference recites in a third embodiment and a seventh embodiment a semiconductor laser device in which a flat portion formed on both sides of a ridge portion has a thickness of 0.05 to 0.15 μm, but presents no disclosure of the thickness of a cladding layer or the size and shape of the cladding layer of the present invention.

Claim 35 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nagahama et al. in view of previously cited U.S. Patent No. 4,961,197 to Tanaka et al. The Examiner admits that Nagahama et al. does not necessarily disclose the further limitation as defined by claim 35. However, the Examiner asserts that the use of current blocking layers in the art of nitride based semiconductor laser devices for the specific purpose (motivation) to improve light emitting efficiency has long been known, as evidenced by Tanaka et al.

As noted above, the presently amended claims should be seen to overcome the above rejections. With reference to the third cited reference, Applicants note that Tanaka is cited for a current blocking layer with a striped opening, and fails to recite a semiconductor laser device in which a cladding layer has a thickness of less than 0.3 μm. Applicants note that the Tanaka

reference recites, for example, in Example 1 a semiconductor laser device in which a flat portion formed on both sides of a ridge portion has a thickness of 0.3 to 0.5 μm, but fails to recite a semiconductor laser device in which a flat portion formed on both sides of a ridge portion has a thickness of 0.05 to 0.15 μm.

In contrast, in the present invention, a cladding layer of a first conduction type includes a ridge portion and a flat portion formed on both sides of the ridge portion, wherein the cladding layer has a thickness of less than 0.3 μm, and the flat portion has a thickness of 0.05 to 0.15 μm. This size and shape of the cladding layer of a first conduction type, which is not recited at all in any of the cited references prevents light from spreading out from a light emitting layer into the cladding layer of a first conduction type, and causes effective confinement of light in the light emitting layer. This allows a vertical transverse mode to be a lowest-order fundamental mode, resulting in a reduced threshold current as well as improved focusing characteristics for a laser beam.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

Kenneth H. Salen
Attorney for Applicants
Registration No. 43,077

KHS/led
1250 Connecticut Avenue, NW
Suite 700
Washington, D.C. 20036
(202) 822-1100